PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

July 18, 2006

In re the application of:

Jeffrey S. Pyle

Docket No. 508P003

Filed: 02/21/2006

Art Unit: 3662

Ser. No. 10/756,860

Examiner: Lobo, Ian J.

For: System and Method for Synchronous Sampling and Asynchronous Transfer of Data with Connectionless Powering and Control of Data Link Subsystems

Confirmation No. 3418

AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In reply to the non-final Office Action of February 21, 2006, identified as Paper No. 20060215, please amend the above reference application as follow:

Amendment to the Claims begin on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (currently amended) A system for measurement of the value of a parameter at a plurality of spaced locations and for transmitting electrical signals commensurate with said parameter value to a position remote from said ~~points~~ spaced locations, said system comprising:

a) an elongated member having an insulated conductor and a coaxial cable extending therein;

b) a plurality of sensing elements positioned in spaced relation along said elongated member with at least one of said sensor elements at each of said spaced locations, to generate electrical signals commensurate with said parameter value;

c) an electrical power source to which said first end of said insulated conductor is in electrical communication; and

d) means for inductively coupling said power source to said sensing elements to provide electrical power for operation of said sensing elements;

e) a control element for selective generation of electrical signals representing data to which said sensing elements are responsive; and

f) wherein said electrical signals are communicated to said sensing elements over said coaxial cable.

2. (original) The system of claim 1 wherein said means for inductively coupling comprise ~~an elongated conductor in electrical communication with said power source and extending along said elongated member,~~ and a plurality of current transformers encircling said insulated conductor.

3. (original) The system of claim 2 wherein said current transformers include a toroidal core with open center through which said insulated conductor extends.

4. (original) The system of claim 3 and further including data storage means associated with each of said sensing elements.

5. (cancelled)

6. (cancelled).

7. (original) The system of claim [[6]] 1 wherein said coaxial cable is in coupled mode.

8. (original) The system of claim 7 wherein said coaxial cable extends along at least a portion of the length of said elongated member.

9. (original) The system of claim 8 wherein said means for inductively coupling comprises ~~an insulated conductor in electrical communication with said power source and~~ a

plurality of current transformers, and wherein said insulated conductor and said coaxial cable extend in substantially parallel relation along said elongated member.

10. (original) The system of claim 9 and further including a control node to which said coaxial cable is connected and wherein each of said sensing elements include RF receiving and transmitting means for transfer of data in the form of RF signals between said coaxial cable and said sensing elements.

11. (original) The system of claim 10 wherein said power source provides AC power to said conductor, and wherein each of said sensing elements further includes a phase locked loop to control the frequency of the AC power and thereby the frequency of generation of said electrical signals.

12. (original) The method of measuring the value of a predetermined parameter at a plurality of locations spaced along the length of an elongated member suited for towing behind a moving vehicle, said method comprising:

a) positioning a sensing element adapted to generate electrical signals commensurate with said parameter value at each of said plurality of locations;

b) providing a source of electrical power;

c) inductively coupling said source of electrical power to each of said sensing elements via an insulated conductor to provide electrical power for operation thereof;

d) positioning a coaxial cable to extend in proximity to each of said sensing elements; and

e) transmitting said electrical signals via said coaxial cable to a remote location for receipt by an end user.

13. (original) The method of claim 12 wherein said inductively coupling comprises providing a plurality of current transformers, each having a toroidal core with open center, and ~~passing a single,~~ with said insulated conductor passing through said open center of each of said cores.

14. (original) The method of claim 13 wherein said coaxial cable is in coupled mode.

15. (original) The method of claim 12 wherein said sensing elements are powered solely by said inductive coupling to said power source.

16. (original) The method of claim 15 wherein said sensing elements include RF receiving and transmitting capability, and further including connecting to said coaxial cable a control node having selectively operable signal generating capability for actuating any selected one of said sensing elements to transmit, via said coaxial cable, said signals commensurate with said parameter value.

17. (original) The method of claim 16 wherein said power source generates AC power, and comprising the further steps of controlling the frequency of said AC power by a phase locked loop at each of said sensing elements and repeatedly generating said electrical signals at a rate commensurate with said controlled frequency.

18. (withdrawn) An acoustic sensing array for obtaining measurements of sound energy at any of a plurality of spaced positions upon generation of a command signal, said array comprising:

a) an elongated member;

b) a plurality of microcells each including at least one sensing element for generating electrical signals commensurate with the value of sound energy at its location, and RF receiving and transmitting means;

c) means supporting one of said microcells upon said elongated member at each of said spaced positions;

d) an insulated electrical conductor extending along at least a portion of the length of said elongated member;

e) a source of AC electrical power connected to said conductor;

f) means for inductively coupling said conductor to each of said microcells to provide electrical power for operation of said microcells;

g) a coaxial cable extending along at least a portion of the length of said elongated member;

h) a control node for transmitting outgoing and receiving incoming RF signals via said coaxial cable to and from said sensing elements, thereby providing sound energy data which is synchronously sampled and asynchronously transmitted by said sensor array while eliminating physical electrical connections for both powering and signaling.

19. (withdrawn) The sensor array of claim 18 wherein said coaxial cable is in coupled mode.

20. (withdrawn) The sensor array of claim 19 wherein said elongated member is cylindrical and said control node is mounted therein.

21. (withdrawn) The sensor array of claim 20 wherein said elongated member is hollow and said conductor and coaxial cable extend through the open center thereof.

22. (withdrawn) The sensor array of claim 18 wherein said means for inductively coupling comprise a plurality of current transformers, each having a toroidal core with open center through which said conductor passes.

23. (withdrawn) The sensor array of claim 22 each of said microcells further includes a phase locked loop for controlling the frequency of said AC power and wherein said phase locked loop is connected to said sensing element to control the frequency of generation of said electrical signals.

24. (withdrawn) The sensor array of claim 23 wherein said microcells each include means for converting said AC power to DC power at a terminal of said microcells.

Remarks/Arguments

The present amendment is made is response to the non-final Office Action ofApril 10, 2006, identified as Paper No. 20060329. Claims 1-17 remain pending in the present application.

In the Action, the Examiner rejected claims 1-11 under 35 U.S.C. § 112, second paragraph as indefinite. The Examiner also rejected claims 1-5 under 35 U.S.C. § 102(b) as anticipated by U.S. Patents No. 6,091,670 to Oliver, et al ("*Oliver*") and U.S. Patents No. 5,200,930 to Rouquette ("*Rouquette*"). Claims 6-17 were rejected under 35 U.S.C. § 103(a) as obvious over *Oliver* and *Rouquette* in view of U.S. Patent No. 3,748,638 to Montgomery, Jr. ("*Montgomery*"). Copies of the cited references are enclosed.

I. Rejections under 35 U.S.C. § 112, Second Paragraph

Claim 1 has been amended to correct the errors noted by the Examiner.

II. Rejections under 35 U.S.C. § 102 in view of *Oliver*

Claim 1 has been amended to include limitations previously recited in several of the dependent claims, most of which were not addressed by the Examiner. Claim 1 thus does not contain any new matter. Claim 1 now recites, among other things, an elongated member housing an insulated conductor for providing power to the sensors via inductive coupling ***and*** a separate coaxial cable for transmitting electrical signals representing data to and from the sensors. The limitations recited in claim 1 are not disclosed in *Oliver*, and the claimed invention is therefore not anticipated under 35 U.S.C. § 102. *See* MPEP § 2131 ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference").

According to the Examiner, *Oliver* discloses (a) an elongated member, (b) a plurality of sensing elements along the member; (c) an electrical power source; and (d) means for inductively

coupling said power source to said sensing elements. *Oliver* does not, however, disclose the use of an ***insulated conductor to provide power*** via inductive coupling along with a ***separate coaxial cable for communicating data.*** For example, *Oliver* states that the towed cable contains "a wire bundle 22 for transmitting electrical power and/or data between the towing vessel and the electrical components within the cable 20." Col. 5, lines 42-44. As a result, electrical signals and power signals are disadvantageously combined onto a conventional twisted wire or wire bundle (unless battery power is used locally as an option in *Oliver*). By contrast, the present invention separates power transmission from data transmissions by providing power over an insulated conductor and communications over a coaxial cable. As the limitations directed to this structure in the claims are utterly absent from the cited reference, the rejections under 35 U.S.C. § 102 in view of *Oliver* must be withdrawn.

III. Rejections under 35 U.S.C. § 102 in view of *Rouquette*

According to the Examiner, *Rouquette* discloses (a) an elongated member, (b) a plurality of sensing elements along the member; (c) an electrical power source; and (d) means for inductively coupling said power source to said sensing elements. *Rouquette* does not disclose inductive coupling between a ***power source*** and a sensor, however, as the structure relied on by the Examiner is the inductive coupling between the return ***signal lines*** and the sensor. In fact, *Rouquette* explains in the portion of the specification cited by the Examiner that a capacitor is used to ***block*** power signals from reaching the sensor.

Rouquette also fails to disclose the claimed separation of power and communication signals into two lines, an insulated conductor and a coaxial cable, respectively. Instead, *Rouquette* uses a twisted wire pair for signal communications and transmitted power from a DC power supply (140). As a result, *Rouquette* fails to disclose express limitations of the claimed

invention and therefore cannot serve as the basis for an anticipation rejection under 35 U.S.C. § 102.

IV. Rejections under 35 U.S.C. § 103(a) in further view of *Montgomery*

According to the Examiner, one of ordinary skill in the art would be motivated to replace the twisted wire pair of *Oliver* or *Rouquette* with a coaxial cable according to *Montgomery* because coaxial cable is cheaper. The proposed motivation is insufficient to render the claimed invention obvious for several reasons.

First, it is doubtful that coaxial cable, a multi-layer product having two conductors and multiple layers of dielectric is actually cheaper than a conventional twisted wire pair. Regardless, *Montgomery* does not teach that coaxial cable ***alone*** is cheaper than twisted wire. *Montgomery* actually teaches that using a coaxial cable to connect multiple seismic stations in series (provided that each station also includes repeaters at each station, *i.e.*, circuitry for receiving the transmissions at each stations and then retransmitting the information to the next station) is cheaper than running a twisted wire pair individually to each station. Col. 1, lines 30-41. As *Montgomery* teaches that a ***single*** coaxial cable is cheaper than ***multiple*** twisted wire pairs, the reference does not motivate replacing a ***single*** twisted wire pair with a ***single*** coaxial cable.

Second, both of the primary references use a ***single*** pair of twisted lines to connect all of the sensors. The systems disclosed in these reference are thus not configured like the multiple, individually wired seismic stations that *Montgomery* sought to improve with the use of a single coaxial cable and repeaters at each stations. Thus, one of ordinary skill in the art would not be motivated by *Montgomery* because it has absolutely no applicability to *Oliver* or *Rouquette*. See MPEP § 2143.02 (motivation or suggestion must have some reasonable expectation of success).

Third, *Montgomery* ***requires*** the use of repeaters at each station for proper operation. Neither the cited references nor the claimed invention rely on repeaters, and the addition of such repeaters is unwarranted and burdensome. *See* MPEP 2143.01(IV) ("If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification").

Fourth, even if *Montgomery* did teach the replacement of a single twisted wire pair with a single coaxial cable as suggested by the Examiner, the claimed invention requires an insulated conductor for power transmission ***and*** a coaxial cable for data transmission. A modification of *Oliver* or *Rouquette* as proposed by the Examiner still would not include all of the limitations of the claimed invention as the modified system would not have an insulated conductor to provide power via inductive coupling ***and*** a separate coaxial cable for communicating data. MPEP § 2143.03 ("To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art").

A Two Month Petition for Extension of Time is submitted herewith and the Examiner is enabled to charge any fees associated with his transaction to Deposit Account 50-1546.

In view of the amendments made herein as supported by these foregoing remarks, the Examiner's reconsideration is respectfully requested. Should the Examiner believe an interview would expedite prosecution of this application, please contact the undersigned at 315-218-8515.

Respectfully submitted,

Dated: July 18, 2006

By: _____
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